AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application.

Listing of Claims:

1. (currently amended) A method for selecting an optimal test sequence from a sequence of N tests for detecting faults in ~~the elimination of one or more redundant tests and the reordering of one or more inefficient tests in~~ digital integrated circuits (IC's) ~~further~~ comprising:

for each test of the ~~a~~ sequence of N tests, compiling test results for L ~~common~~ defective dice, wherein said N tests comprise one or more redundant tests and one or more inefficient tests;

representing each test of the sequence of N tests as a correlation vector of length L, such that the sequence of N tests is represented as N correlation vectors, wherein element *j* of correlation vector for test *i* is zero if device *j* passed test *i*.

finding a first correlation vector of the N correlation vectors that has the most non-zero components and initializinge a vector W to be the complement of the first correlation vector;

selecting a first test in the optimal test sequence to be the test represented by the first correlation vector;

for each correlation vector of the remaining N-1 correlation vectors, calculating a product of the complement of each correlation vector and the vector W;

calculating a length of a projection of each calculated product vector onto a unit vector;

finding a next correlation vector that is the correlation vector of the N-1 correlation vectors that has a smallest value of the projection length;

selecting a next test in the optimal test sequence to be the test represented by the next correlation vector;

updating the vector W to be a product of vector W and a compliment of the determined correlation vector in the previous step; and

repeating the previous five ~~four~~ elements, until the length of the projection of vector W onto the unit vector is zero.

2. (original) The method of claim 1, wherein the correlation vector that has the smallest value of the projection length is stored as one of the correlation vectors in an optimized set.

3. (original) The method of claim 1, wherein each correlation vector is represented using a binary-valued L-dimensional vector.

4. (original) The method of claim 1, wherein a multiplication of two vectors is defined to be a vector which components are calculated from the logical AND operation of the corresponding components of the two vectors.

5. (original) The method of claim 1, wherein the execution time of each test is the same.

6. (original) The method of claim 1, wherein prior to compiling the N tests, executing the sequence of N tests without stopping at a failing test.

7. (original) The method of claim 1, further comprising analyzing the correlation among the N tests by representing each test of the n tests in a L-dimensional defective die space using a binary-valued L-dimensional vector.

8. (original) The method of claim 2, wherein finding a vector in the optimized set of vectors further comprises determining the vector of the remaining vectors with a smallest value of the square of the length of the projection of vector W onto the unit vector.

9. (currently amended) The method of claim 2 [[1]], wherein finding a vector of the optimized set further comprises all remaining vectors of the N correlation vectors with zero projection onto vector W representing zero defects.

10. (currently amended) The method of claim 1, further comprising obtaining ~~the~~ an optimized set by sorting the projection lengths of the N correlation ~~projection~~ vectors in a descending order.

11. (currently amended) A method for ~~the~~ reordering a sequence of N tests for detecting faults ~~of one or more inefficient tests~~ in digital integrated circuits (IC's) as an optimal sequence of tests when the execution time of each test is the same, ~~further~~ comprising:

for each test of the ~~a~~ sequence of N tests, compiling test results for L ~~common~~ defective dice;

representing each test of the sequence of N tests as a correlation vector using a binary-valued L-dimensional vector, wherein bit *j* of correlation vector for test *i* is zero if device *j* passed test *i*;

finding a first correlation vector of the N correlation vectors that has the most non-zero components and initializeing a vector W to be the complement of this first correlation vector;

storing the test represented by the first correlation vector as a first test in the optimal sequence of tests;

defining a multiplication of two correlation vectors to be a vector with components calculated from the logical AND operation of the corresponding components of the two correlation vectors;

for each correlation vector of the remaining correlation vectors, calculating a product vector of the complement of each correlation vector and vector W using the multiplication definition in the previous element;

calculating a projection length of each product vector onto the unit vector;

finding a next correlation vector that is the correlation vector that has the smallest value of the projection length;

storing the test represented by the next ~~this~~ correlation vector as a test ~~one of the correlation vectors~~ in ~~an~~ the optimized sequence of tests;

updating vector W to be the product of vector W and a compliment of the correlation vector in the previous step;

repeating the previous five elements, until the length of the projection of vector W onto the unit vector is zero; and

assigning the vector W to be the unit vector and repeating the previous six elements until there are no remaining vectors.

12. (currently amended) A method for ~~the~~ reordering a sequence of N tests as an optimal sequence of tests for detecting faults ~~of one or more inefficient tests~~ in digital integrated circuits (IC's) when the execution times of the ~~each~~ tests in the sequence of N tests are not all the same, ~~is the different, further~~ comprising:

for each test of the ~~a~~ sequence of N tests, compiling test results for L ~~common~~ defective dice and storing the execution time of the sequence of N tests;

representing each test of the sequence N tests as a correlation vector using a binary-valued L-dimensional vector, wherein bit *j* of correlation vector for test *i* is zero if device *j* passed test *i*;

finding a first correlation vector of the N correlation vectors that has the largest value of the number of non-zero components divided by the execution time of the corresponding test and then initialize vector W to be a complement of this vector;

storing the test represented by the first correlation vector as a first test in the optimal sequence of tests;

defining the multiplication of two correlation vectors to be a vector with components that are calculated from the logical AND operation of the corresponding components of the two correlation vectors;

for each correlation vector of the remaining correlation vectors, calculating a length of a projection of the correlation vector onto vector W;

calculating a quotient of the calculated projection length in the previous step and the execution time of the corresponding test;

finding a next correlation vector that is the correlation vector that has the largest value of the quotient calculated in the previous step;

storing the test represented by the next ~~this~~ correlation vector as a test ~~one of the correlation vectors~~ in ~~an~~ the optimized sequence of tests;

updating vector W to be the product of vector W and the compliment of the stored correlation vector in the previous step; and

repeating the previous five elements, until the length of the projection of vector W onto the unit vector is zero.

13. (currently amended) A method for ~~the~~ reordering a sequence of N tests as an optimal sequence of tests for detecting faults ~~of one or more inefficient tests~~ in digital integrated circuits (IC's) when the execution times of the ~~each~~ tests in the sequence of N tests are not all the same, ~~is the different, further~~ comprising:

for each test of a sequence of N tests, compiling test results for L ~~common~~ defective dice and storing the execution time of the sequence of N tests;

representing each test of the sequence of N tests as a correlation vector using a binary-valued L-dimensional vector, wherein bit *j* of correlation vector for test *i* is zero if device *j* passed test *i*;

finding a first correlation vector of the N correlation vectors that has the largest value of the number of non-zero components divided by the execution time of the corresponding test and then initialize a vector W to be a complement of this vector;

storing the test represented by the first correlation vector as a first test in the optimal sequence of tests;

defining a multiplication of two correlation vectors to be a vector with components that are calculated from the logical AND operation of the corresponding components of the two correlation vectors;

for each correlation vector of the remaining correlation vectors, calculating a length of a projection of the correlation vector onto vector W;

calculating a quotient of the calculated projection length in the previous step and the execution time of the corresponding test;

finding a next correlation vector that is a correlation vector that has the largest value of the quotient calculated in the previous step;

storing the test represented by the next ~~this~~ correlation vector as a test ~~one of the correlation vectors~~ in ~~an~~ the optimized sequence of tests;

updating vector W to be the product of vector W and a compliment of the stored correlation vector in the previous step;

repeating the previous five elements, until the length of the projection of vector W onto a unit vector is zero; and

assigning vector W to be the unit vector and repeating the previous six elements until there are no remaining vectors.